

WHAT IS CLAIMED IS:

1 1. A thin film transistor comprising:
2 a buffer layer formed on a substrate;
3 an activation layer formed on said buffer layer; and
4 a gate insulation layer formed on said substrate including said activation layer,
5 with said buffer layer having a step formed between a lower part of said activation layer and
6 a part except said lower part of said activation layer, and said step being a half or less of the
7 thickness sum of said activation layer and gate insulation layer.

1 2. The thin film transistor according to claim 1, wherein said buffer layer has a step to
2 such a degree that thickness of said gate insulation layer is not changed on said side wall of said
3 buffer layer.

1 3. The thin film transistor according to claim 1, wherein a thickness of the gate
2 insulation layer is at least 400 Å when the thickness of SPC polysilicon is 300 Å and step is 350 Å
3 in the activation layer.

1 4. The thin film transistor according to claim 1, wherein thickness of the gate insulation
2 layer is at least 1,000 Å when the thickness of ELA polysilicon is 500 Å and step is 750 Å in the
3 activation layer.

1 5. The thin film transistor according to claim 2, wherein a thickness of the gate
2 insulation layer is 400 Å or more when the thickness of SPC polysilicon is 300 Å and step is 350 Å
3 in the activation layer.

1 6. The thin film transistor according to claim 2, wherein thickness of the gate insulation
2 layer is 1,000 Å or more when the thickness of ELA polysilicon is 500 Å and step is 750 Å in the
3 activation layer.

1 7. A method for fabricating a thin film transistor comprising the steps of:
2 depositing an amorphous silicon layer on a substrate equipped with buffer layer;
3 forming a polycrystalline silicon layer by crystallizing said amorphous silicon layer;
4 forming an activation layer by etching said polycrystalline silicon layer;
5 treating the surface of said activation layer; and
6 depositing a gate insulation layer on said substrate,
7 with etching time being controlled in said activation layer forming process and activation
8 layer surface treatment process so that step between a lower part of gate in the buffer layer and a part
9 except the lower part of said gate has a step value corresponding to a half or less of the thickness sum
10 of said activation layer and gate insulation layer.

1 8. The method for fabricating a thin film transistor according to claim 7, wherein the

2 etching time is controlled so that said buffer layer has a step to such a degree that thickness of said
3 gate insulation layer is not changed on said side wall of said buffer layer.

1 9. The method for fabricating a thin film transistor according to claim 7, wherein the
2 etching time is controlled to accommodate said buffer layer having a step corresponding to a half or
3 less of the thickness sum of the activation layer and gate insulation layer.

1 10. The method for fabricating a thin film transistor according to claim 9, wherein the
2 etching time is controlled so that said buffer layer has a step to such a degree that thickness of said
3 gate insulation layer is not changed on said side wall of said buffer layer.

1 11. The method for fabricating a thin film transistor according to claim 7, wherein a
2 thickness of said gate insulation layer is 400 Å or more when the thickness of SPC polysilicon is 300
3 Å and step is 350 Å in said activation layer.

1 12. The method for fabricating a thin film transistor according to claim 7, wherein
2 thickness of said gate insulation layer is 1,000 Å or more when the thickness of ELA polysilicon is
3 500 Å and step is 750 Å in said activation layer.

1 13. A thin film transistor, comprising:
2 a buffer layer;

3 an activation layer formed on said buffer layer; and
4 a gate insulation layer formed on said buffer layer and said activation layer,
5 with said buffer layer having a step formed between a lower part of said activation layer and
6 a part except said lower part of said activation layer, and said step being up to a half of the thickness
7 sum of said activation layer and gate insulation layer.

1 14. The thin film transistor according to claim 13, with said step being controlled
2 according to said gate insulation layer being deposited to an even thickness on a side wall of said
3 activation layer.

1 15. The thin film transistor according to claim 13, with a thickness of said gate insulation
2 layer being at least 400 Å when the thickness of SPC polysilicon is 300 Å and step is 350 Å in said
3 activation layer.

1 16. The thin film transistor according to claim 13, with a thickness of said gate insulation
2 layer being at least 1,000 Å when the thickness of ELA polysilicon is 500 Å and step is 750 Å in said
3 activation layer.

1 17. A method for fabricating a thin film transistor, comprising:
2 forming a polycrystalline silicon layer;
3 forming an activation layer by etching said polycrystalline silicon layer;

4 treating the surface of said activation layer; and
5 depositing a gate insulation layer on said substrate,
6 with etching time being controlled in the activation layer forming process and activation layer
7 surface treatment process to accommodate a step between a lower part of a gate in said buffer layer
8 and a part except the lower part of said gate having a step value corresponding up to a half of the
9 thickness sum of said activation layer and gate insulation layer.

1 18. The method for fabricating a thin film transistor according to claim 17, wherein the
2 etching time is controlled to accommodate said buffer layer including the step to such a degree where
3 said gate insulation layer is deposited to an even thickness on a side wall of said activation layer.

1 19. The method for fabricating a thin film transistor according to claim 17, wherein the
2 etching time is controlled to accommodate said buffer layer having a step corresponding up to half
3 of the thickness sum of the activation layer and gate insulation layer.

1 20. The method for fabricating a thin film transistor according to claim 17, wherein a
2 thickness of said gate insulation layer is at least 400 Å when the thickness of SPC polysilicon is 300
3 Å and the step is 350 Å in the activation layer or the thickness of said gate insulation layer is at least
4 1,000 Å when the thickness of ELA polysilicon is 500 Å and the step is 750 Å in said activation
5 layer.